

## REMARKS

Claims 28, 30-34, 36-48, 50-52, and 54-57 were pending and examined. By virtue of the instant Amendment and Response, claims 28, 34 and 57 are amended and claim 32 is canceled. No claims are added. Claims 1-27, 29, 35, 49, and 53 were previously canceled. Accordingly, claims 28, 31, 33, 34, 36-48, 50-52 and 54-57 are currently pending. Applicants submit no new matter is added herein.

### Claim Amendments

Without addressing the patentability of claims 28 and 57 as previously presented in view of the cited documents, and without addressing the relevancy (if any) of the documents, and merely to streamline prosecution of the present application, clarifying amendments have been made to claims 28 and 57. Support for the amendments can be found throughout the instant application, and specifically in the original claims.

### Claim Rejections Under 35 USC §103

Claims 28-34, 36, 40-43, 47, 54 and 57 were rejected under 35 USC §103(a) as allegedly being unpatentable over U.S. Patent No. 5,875,223 to Nylund in view of U.S. Patent No. 5,331,679 to Hirukawa. With respect to claim 29, Applicants respectfully submit the instant rejection is moot as claim 29 was previously canceled. Concerning the remainder of the claims, Applicants respectfully disagree with the Examiner and traverse this rejection.

The Examiner states that Nylund “fails to teach that the upper edge, seen transversely to the longitudinal axis, has a wave-like shape with wave peaks, which are aligned with a respective one of said abutment surfaces, and with wave valleys located between two adjacent ones of said abutment surfaces.” However, the Examiner states that the lack of disclosure in Nylund is remedied by Hirukawa since, according to the Examiner, “Hirukawa teaches a sleeve-like member 12d wherein the upper edge, seen transversely to the longitudinal axis, has a wave-like shape with wave peaks 21b, which are aligned with a respective one of said abutment surfaces 13a, and with wave valleys 22 located between two adjacent ones of said abutment surfaces 13a

(figure 13).” *See* Office Action, pg. 3. The Examiner states that Hirukawa at col. 9, lines 46-51 provides motivation to combine the two cited references and therefore, it would have been obvious to one of ordinary skill in the art to construct the sleeve-like member to have a wave-like shape with wave peaks, which are aligned with a respective one of said abutment surfaces, and with wave valleys located between two adjacent ones of said abutment surfaces at the upper edge of said sleeve-like member. Applicants respectfully disagree.

The disclosures of Nylund and Hirukawa were summarized in Applicants’ response dated November 12, 2008, which is incorporated herein in its entirety, and therefore not reiterated herein.

The spacer of the present invention, as recited in instantly presented claims 28 and 57, and the claims dependent therefrom, includes, *inter alia*, a spacer enclosing a number of cells, each cell having a longitudinal axis and arranged to receive a fuel rod in such a way that the fuel rod extends substantially parallel with the longitudinal axis, each cell being formed by a sleeve, having an upper edge and a lower edge, the sleeve including a number of elongated abutment surfaces, which project inwardly towards the longitudinal axis and extend substantially in parallel with the longitudinal axis for abutment to the fuel rod to be received in the cell, and the lower edge, seen transversely to the longitudinal axis, having a wave shape with wave peaks, which are aligned with a respective one of said abutment surfaces, and wave valleys located between two adjacent ones of said abutment surfaces; wherein the upper edge, seen transversely to the longitudinal axis, has a wave shape with wave peaks, which are aligned with a respective one of said abutment surfaces, and with wave valleys located between two adjacent ones of said abutment surfaces, each of said elongated abutment surfaces extending from a respective one of said wave peaks of the upper edge to a respective one of said wave peaks of the lower edge, and the sleeves abut each other in the spacer along respective connection areas, each extending in parallel to the longitudinal axis between one of said wave valleys of the upper edge and one of said wave valleys of the lower edge.

The instantly claimed invention is entirely contrary to Nylund. First, as acknowledged by the Examiner, Nylund does not disclose an upper edge having a wave with wave peaks. *See*, Office Action at p. 3, and Nylund at FIG. 5 and col. 3, lines 29-32. Rather, Nylund illustrates a spacer having one straight edge and one wavy edge. Applicants submit the lack of disclosure in

Nylund is not remedied by the disclosure of Hirukawa for the reasons set forth in Applicants' previously submitted Responses, which are incorporated by reference herein in their entireties.

In addition to Applicants' previously submitted comments concerning Nylund and Hirukawa, Applicants submit that a combination of the teachings of Nylund and Hirukawa would lead to a spacer, starting from the spacer disclosed in Nylund, having a wave shape also at the upper edge, wherein the wave peaks of the upper edge would be aligned with the wave valleys of the lower edge. Consequently, a person skilled in the art combining the teaching of these two documents would not arrive at the instantly claimed feature that "each of said elongated abutment surfaces extending from a respective one of said wave peaks of the upper edge to a respective one of said wave peaks of the lower edge." Furthermore, Applicants submit that neither Nylund nor Hirakawa, taken alone or in any combination, teach or suggest the feature defining that the "sleeves abut each other in the spacer along respective connection areas, the connection are extending in parallel to the longitudinal axis between one of said wave valleys of the upper edge and one of said wave valleys of the lower edge." Furthermore, Applicants note the spacer of the instant claims provide benefits that were not suggested or taught in either Nylund or Hirukawa and therefore, the instant spacer is an improvement to what was known in the art at the time the invention was made.

Simply stated, there is no teaching or suggestion in either reference, taken alone or in any combination, that could lead a person skilled in the art to modify the teachings of the references so that the wave peaks would be aligned as instantly claimed.

Accordingly, Applicants submit the instant rejection as applied to independent claims 28 and 57, and the claims dependent therefrom, is overcome and respectfully request the Examiner reconsider and withdraw the instant rejection.

Claims 37-39 were rejected under 35 USC §103(a) as allegedly being unpatentable over Nylund and Hirukawa as applied to claim 28, and further in view of U.S. Patent No. 6,901,128 to Mori et al. Applicants respectfully disagree and traverse this rejection.

Nylund and Hirukawa are discussed above. Mori et al. relates to a fuel assembly in a pressurized water reactor, and in particular, to a foreign matter filter serving as a protection

means against foreign matter for preventing intrusion of foreign matter into a fuel effective portion in a coolant. *See* col. 1, lines 9-13.

Applicants respectfully disagree with this rejection, but do not believe it is necessary to address this rejection in detail since claims 37-39 indirectly depend from claim 28 and, as explained in detail above, neither Nylund nor Hirukawa, taken separately or in any combination, teach or suggest the spacer recited in claim 28. Mori et al. does not change the analysis with respect to claim 28 or any of the claims dependent therefrom. Accordingly, Applicants submit this rejection is overcome and respectfully request the Examiner withdraw the rejection.

Claims 48 and 51 were rejected under 35 USC §103(a) as allegedly being unpatentable over Nylund, Hirukawa and Mori as applied to claim 37, and further in view of U.S. Patent No. 5,272,741 to Masuhara et al. Applicants respectfully disagree and traverse the instant rejection.

Nylund, Hirukawa and Mori et al. are discussed in detail above. Masuhara et al. relates to a nuclear fuel assembly and more particularly to a nuclear fuel assembly for a boiling water reactor having space structure improved on heat transfer from fuel rods to the coolant. *See* col. 1, lines 6-9.

Applicants respectfully disagree with this rejection, but do not believe it is necessary to address this rejection in detail since claims 48 and 51 indirectly depend from claim 28 and, as explained in detail above, neither Nylund nor Hirukawa, taken separately or in any combination, teach or suggest the spacer recited in claim 28. Neither Mori et al. nor Masuhara et al., change the analysis with respect to claim 28 or any of the claims dependent therefrom. Accordingly, Applicants submit this rejection is overcome and respectfully request the Examiner withdraw the rejection.

Claims 44 -46 are rejected under 35 USC §103(a) as allegedly being unpatentable over Nylund and Hirukawa and further in view of U.S. Patent No. 4,800,061 to Shallenberger et al. Applicants respectfully disagree and traverse the instant rejection. Applicants respectfully disagree and traverse this rejection.

Nylund and Hirukawa are discussed in detail above. Shallenberger et al. discloses an apparatus and method for facilitating a scratchless insertion of a fuel rod into cellular grids of a nuclear fuel assembly. *See* Abstract.

Applicants respectfully disagree with this rejection, but do not believe it is necessary to address this rejection in detail since claims 44 -46 depend directly from claim 28 and, as explained in detail above, neither Nylund nor Hirukawa, taken separately or in any combination, teach or suggest the spacer recited in claim 28. Shallenberger et al. does not change the analysis with respect to claim 28 or any of the claims dependent therefrom. Accordingly, Applicants submit this rejection is overcome and respectfully request the Examiner withdraw the rejection.

Claims 50 and 52 were rejected under 35 USC §103(a) as allegedly being unpatentable over Nylund and Hirukawa and further in view of Masuhara et al. Applicants respectfully disagree and traverse this rejection.

Nylund, Hirukawa and Masuhara et al. are discussed above.

Applicants respectfully disagree with this rejection, but do not believe it is necessary to address this rejection in detail since claims 50 and 52 indirectly depend from claim 28 and, as explained in detail above, neither Nylund nor Hirukawa, taken separately or in any combination, teach or suggest the spacer recited in claim 28. Masuhara et al. does not change the analysis with respect to claim 28 or any of the claims dependent therefrom. Accordingly, Applicants submit this rejection is overcome and respectfully request the Examiner withdraw the rejection.

Claims 55 and 56 were rejected under 35 USC §103(a) as allegedly being unpatentable over Nylund and Hirukawa and further in view of U.S. Patent No. 5,778,035 to Nylund (referred to hereinafter as “Nylund 2”).

Nylund and Hirukawa are discussed above. Nylund 2 relates to a method for equalizing the cooling between less loaded and more loaded sub-regions of a fuel assembly or between fuel assemblies in a light-water nuclear reactor. The equalization of the cooling is achieved by mixing a coolant flow within a mixing cross section comprising four orthogonally arranged sub-regions which may have considerably different power levels because of different degrees of burnup or the effect from the surroundings. *See* col. 1, lines 5-13.

Applicants respectfully disagree with this rejection, but do not believe it is necessary to address this rejection in detail since claims 55 and 56 indirectly depend from claim 28 and, as explained in detail above, neither Nylund nor Hirukawa, taken separately or in any combination, teach or suggest the spacer recited in claim 28. Nylund 2 does not change the analysis with respect to claim 28 or any of the claims dependent therefrom. Accordingly, Applicants submit this rejection is overcome and respectfully request the Examiner withdraw the rejection.

Applicants believe the foregoing amendments and remarks are fully responsive to the Office Action and that the claims as now presented herein are allowable. An early action to that effect is earnestly solicited. If the Examiner believes that a telephone conference with Applicants' attorneys would be advantageous to the disposition of this case, the Examiner is invited to telephone the undersigned.

Applicants believe no fees are due with this submission; however, Deposit Account No. 503342 may be charged if any other fees are incurred.

Respectfully submitted,

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